Missouri Target Industry Competency Model
Transportation

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Acknowledgements

Access to skilled workers is one of the foremost criteria that companies and site selectors consider when locating and expanding business in Missouri. The ability to show companies an available and sustainable pipeline of skilled workers continues to be the difference in Missouri's ability to turn economic development assets into family supporting job opportunities. To support these efforts the research arm of the Department of Economic Development, the Missouri Economic Research and Information Center (MERIC), has embarked on a project to bring together the appropriate state and local individuals to align education and workforce programs with the future talent development needs of companies.

Industry clusters defined as groups of interdependent businesses linked by core products or services as well as the potential for common supply chains, labor needs, technologies, and markets were identified. These are:

- Agribusiness
- Automotive
- Defense & National Security
- Energy
- Finance
- Information Technology
- Life Sciences
- Transportation/Logistics

For each of these industry clusters Target Industry Competency Models are being developed with the help of target employers and education/training providers in the state.

The Target Industry Competency Model project is intended to identify personal effectiveness, academic, and occupation specific competencies for targeted businesses within the state's Transportation industry cluster. In the first part of this report, it is revealed that along with technical skills employers view "soft skills" as crucial to work readiness. It is also determined that these skills are fundamental to every employee's ability to perform their job effectively. Further, technical competencies for select occupations in the Transportation industry are listed. Within areas of **Trucking**, **Rail** and **Sea Transport**, sector specific technical competencies are developed. Finally, specialized training/education programs for the most common Transportation occupations in the industry are also identified in this report. These results are aimed to serve as a useful human resource tool within organizations and to help shape policies that will address the skill and curriculum gaps in order to meet the future needs of Missouri businesses.

In the recent years, there has been a strategic effort to prepare workers for new and increasing job opportunities in high growth, high demand and economically vital industries and sectors of the American economy. These efforts are targeted to help workers gain skills and competencies required to obtain jobs and build successful careers in these industries[1]. With the free movement of goods and services both nationally and globally, the transportation industry has gained much importance in the state's economy. By hiring properly trained individuals, organizations save money and spend less time preparing their staff in their work roles while colleges and universities have a better understanding towards curriculum development and maintenance[2].

Jobs within this industry are evolving as a response to the increase in the use of technology, stricter security regulations and increased levels of customer service[3]. The objective of designing a Competency Model is to develop a dynamic, industry-driven framework necessary for workers that will help them meet the demands of the globally competitive economy.

Some interesting Missouri Transportation facts:

➢ Between 2006-2016, it is expected that there will be a total of 4,307 job openings due to growth in the Transportation field within the state[3]

➢ From 2005 to 2025, Missouri's older population groups are projected to increase in size relative to the state's population as a whole[4]

➢ 60% of Missouri's workforce in 2025 is already working today[4]

➢ Transportation occupations account for almost 2.03% of the state's overall job openings[3]

➢ The average salary for Transportation occupations in the state is $32,237[5]

What is a Competency Model?

A competency is a specific, identifiable, definable and measurable skill or characteristic that is essential for the performance of an activity within a specific business or industry context. Some examples of competencies are safety awareness, critical analytical thinking, problem solving, communication, team work, etc.

The first competency model was developed in the early 1970s for the US Department of State by David McClelland and his colleagues of McBer and Company as an alternative selection tool for junior Foreign Service Information Officers. Later McBer and Company developed a methodology that is still highly useful today in competency model building and comprises of "*focus on outstanding performers, use of behavioral event interviews, and thematic analysis of interview data and distillation of the results into a smaller set of competencies described in behaviorally specific terms*". In the last 30 years this technique has gained importance as an integral practice in human resource management[6].

Based on the US Department of Labor's (DOL) framework, the competency model can be described as a pyramid consisting of a hierarchical set of tiers. The pyramid is divided into 3 main blocks of **Foundational competencies**, **Industry Related** and **Occupation Related competencies**. Each of these blocks is made up of tiers which consist of a set of competencies that represent the skills, knowledge and abilities essential for success in an occupation in the industry the model represents.

Source: www.CareerOneStop.org/CompetencyModel

Starting from the base, the tiers cover competencies that are common to several occupations and industries. As we traverse up the pyramid, the competencies become industry and occupation specific. It is important to note that the above picture does not suggest that this is a sequential model i.e. one needs to have all the below competencies in order to posses / develop the higher level competencies. The model is constructed in a bottom-up approach using a combination of research, data collection and analysis, focus groups and case study interviews.

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Uses of Competency Models

Competency Models benefit a wide array of users – as a standard set of skills that can be used for recruiting, profiling jobs, evaluating employees, designing academic and professional certification programs. They serve as a bridge between educators, businesses and other stakeholders who are invested in preparing students and workers for today's workplace challenges.

Competency Models can be used by employers as a **useful selection and professional development tool**. It can assist HR staff match specific skills and work requirements to different jobs at selection, promotion, career path development and while developing training programs for the organization. It can help to assess performance of individuals in their jobs as well as in their roles of managers, direct reports, customers and team members. It can also be a means for businesses to communicate their performance expectations to their workers.

Competency Models can serve as a **measure of the gap between employer needs and the offerings of the current education and training delivery system**. Contents of existing coursework can be reviewed and mapped against the tier competencies and a crosswalk can be created and "gaps" can be identified. As education/ training providers evaluate existing programs or design new ones, the Competency model can **serve as a benchmark**, resulting in addition of courses that will match workplace requirements and trends[7].

Training providers can also use competency models to **develop industry-validated certifications**. Acquiring such a certification establishes that the graduate of the particular training program has demonstrated mastery in the competencies as stated in the model for that industry or sector[8].

Competency models work as a guide for Workforce Investment Boards and One Stop Career Centers to **match job requirements and skill sets determined by employers to potential candidates**. In this way an even larger group of individuals such as in-school youth, out-of school youth, dislocated workers, current workers, and special needs populations are serviced thus increasing the talent pool of available workers.

As these key partners work together by sharing assets and resources, the competency model provides a **good guidance for government investments in workforce preparation strategies** within a region or the state.

Best Practices

A great deal of research has been done to design competency models by both the private sector and government agencies to address the skill needs of the entities.

The OHIO Department of Education uses the Career Field Technical Content Standards for Transportation Systems. It serves as the curriculum framework for Ohio College Tech Prep and Career-Technical Educational programs in Transportation Systems. Used in collaboration with other programs in the state, this document forms the basis for enhancing and expanding career-technical education and post secondary degree programs in Transportation[9].

In California, the Employment Development Department , LMI Division developed a California Occupational Guides tool for careers in Logistics. This database can provide job seekers with a summary guide including job description, job outlook, wages and qualification requirements for all related careers in the state[10].

The New Jersey State Employment and Training Commission (SETC) in collaboration with the New Jersey Department of Labor and Education developed a project called The Ready for the Job Project. Transportation/Logistics was one of the industries they focused on. The report summarized the skill, knowledge and educational requirement of key transportation and logistics occupations and identified strategies that would address the workforce challenge facing the industry in the state of New Jersey[11].

Shoreline Community College in collaboration with the Washington State Board for Community and Technical College designed a Transportation Skill Standards. These standards identified critical work functions and performance indicators that identify the knowledge, skills and abilities needed by workers to succeed in their jobs within this industry[12].

In Georgia the competency-based curriculum framework for Transportation Logistical Support outlines core employability skills for Transportation occupations in collaboration with businesses and educators. The main objective of this initiative is to ensure that curriculum reflects the demands of the workplace and is well positioned to prepare students to meet these needs for success in their future jobs[13].

Using the framework described earlier, we begin to construct the Transportation Competency model tier by tier.

Workplace Competencies

Academic Competencies

Personal Effectiveness Competencies

The **Foundational Competencies** block includes Tiers 1 through 3 and the essentials for early success in school and work life are identified. These competencies are integral for all workers to be successful in any organization and across all occupations in all industries. An industry survey with a specific set of questions was designed and administered to Transportation industry professionals in the region to identify the competencies in this tier. Often business leaders elaborated on certain competencies outside the survey questions, which was also incorporated into the tiers.

Tier 1: Personal Effectiveness Competencies

Starting at the bottom of the pyramid this tier is comprised of competencies that are often referred to as "soft skills" and essential in all life roles. Using the US DOL competency model as a framework, the survey results were mapped against O*Net[14] (a system that serves as the nation's primary source of occupational information, providing comprehensive information on key attributes and characteristics of workers and occupations) and Education Clusters data to develop this tier.

INDUSTRY SURVEY RESPONSES	O* NET DIRECTORY	EDUCATION CAREER CLUSTERS DATA	US DOL COMPETENCY MODEL FRAMEWORK

TIER 1– Personal Effectiveness Competencies				
Professionalism	Dependability & Reliability	Willingness to Learn	Interpersonal Skills	Integrity

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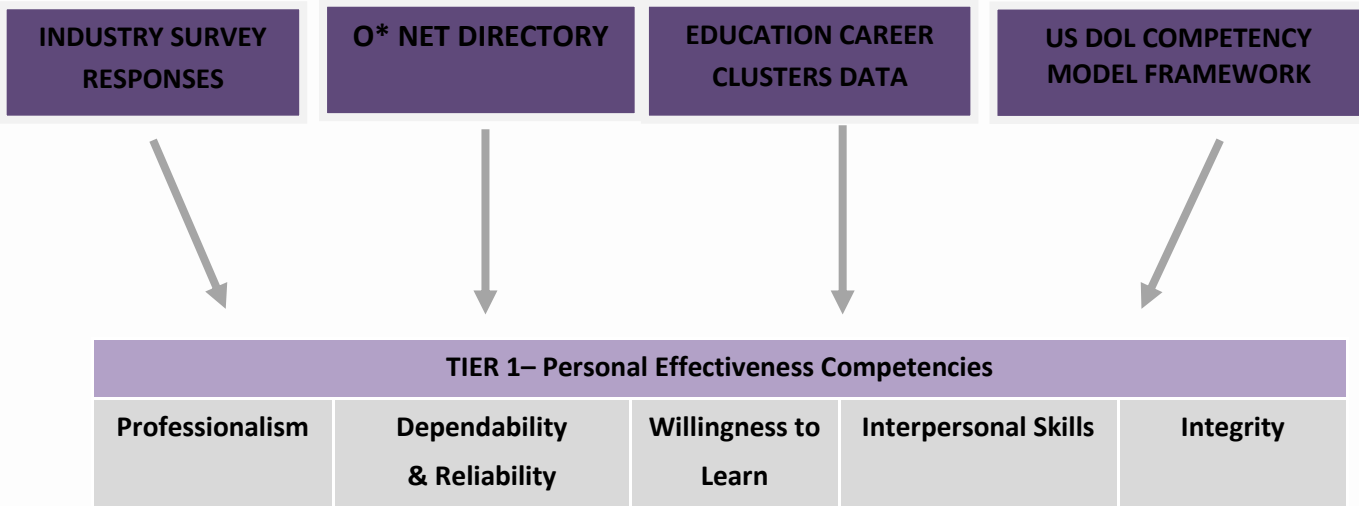
Each competency is then described in terms of behavioral attributes.

Professionalism

Attributes
Demonstrates self discipline, self-worth and positive attitude in a work situation
Is free from substance abuse
Maintains a professional appearance
Complies with organizational policies and procedures
Takes responsibility for one's own work assignment

Dependability & Reliability

Attributes
Follows policies and procedures, thus exhibiting commitment to the organization
Diligently follows through on commitments and consistently meets deadlines
Demonstrates regular and punctual attendance

Willingness to Learn

Attributes
Is flexible and willing to learn new knowledge and skills
Develops a personal career plan to meet career goals and objectives
Takes charge of personal career development by identifying occupations interests, strengths, options and opportunities

Interpersonal Skills

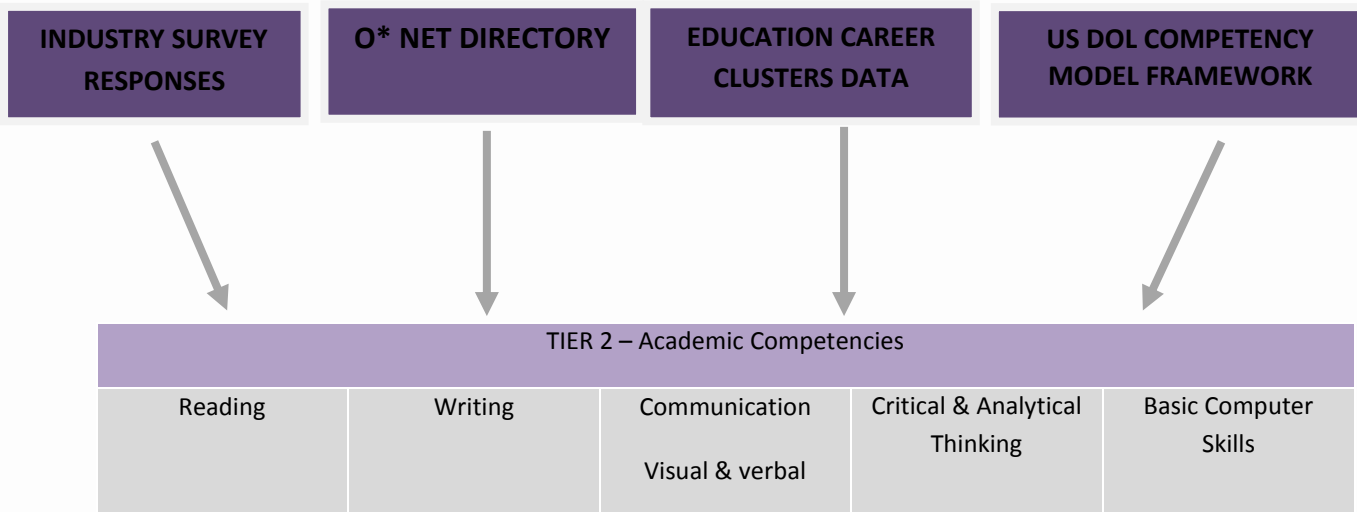| Attributes |
| --- |
| Maintains open communication with others, recognizes and accurately interprets the verbal and non verbal behavior of others. |
| Demonstrates culture and diversity awareness |
| Displays adequate concern for others by being sensitive to their needs and feelings |

Integrity

Attributes
Abides by a strict code of ethics and behavior
Treats others with honesty, fairness and respect
Takes responsibility for one's actions and for those of one's group, team or department

Foundational Competencies

Tier 2—Academic Competencies

The second tier in the Foundation competencies block covers basic educational competencies that are learned in an educational setting along with cognitive functions and thinking styles. Typically these competencies form the foundation for the Occupation and Industry specific Competencies. This tier was also developed by mapping the survey results against O*Net and Education Clusters data.

INDUSTRY SURVEY RESPONSES	O* NET DIRECTORY	EDUCATION CAREER CLUSTERS DATA	US DOL COMPETENCY MODEL FRAMEWORK

TIER 2 – Academic Competencies				
Reading	Writing	Communication Visual & verbal	Critical & Analytical Thinking	Basic Computer Skills

Each competency is then described in terms of behavioral attributes.

Reading

Attributes
Comprehends and evaluates oral and written information in documents such as maps; navigation charts, switching orders, train orders, or arrival and departure schedules, technical drawings, work orders, instructions, formulas or processing charts, technical operating, service or repair manuals
Locates written information from various sources to communicate with co-workers and clients or participants
Critically evaluates and analyzes information in written materials
Applies what is learned from written material to follow instructions and complete specific tasks

Writing

Attributes
Demonstrates ability to organize/collect, evaluate and present written information in the form of reports, graphs, flow charts, directions and manuals
Communicates thoughts, ideas, information, messages and other written information in a logical and coherent manner
Adapts language for audience, purpose, situation

Communication

Attributes
Interprets verbal and non verbal behaviors to enhance communication with co-workers and clients / participants

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| Applies active listening skills to obtain and clarify information |
| Speaks clearly and confidently in a logical manner |
| Receives, attends to, interprets, understands and responds to verbal messages |
| Understands and acts upon instruction to complete assignments |
| Signals and observes directions or warnings to and from coworkers |
| Recognizes universal signs and symbols such as colors, flags, stakes to function safely in the workplace |

Critical and Analytical Thinking

Attributes
Demonstrates sufficient inductive and deductive reasoning ability to perform job
Identifies connections between issues, quickly understands, orients and changes direction as and when necessary
Simple solutions to problems, common sense

Basic Computer Skills

Attributes
Understands and efficiently uses basic computer hardware and software to perform tasks and is familiar with fundamental capabilities of computers
Enters data into computer with acceptable degree of accuracy
Uses word processing programs to create, edit and retrieve files
Uses spreadsheet software to enter, manipulate, edit and format text and numerical data
Uses electronic mail applications
Uses the internet and web based tools to manage basic workplace tasks

Tier 3 —Workplace Competencies

The competencies in this tier include those skills and abilities that permit an individual to conduct his/her work related activities in an effective and efficient manner. These competencies were derived from the Education Career Cluster Data and the US DOL Competency Model Framework.

	EDUCATION CAREER CLUSTERS DATA		US DOL COMPETENCY MODEL FRAMEWORK	

TIER 3 – Workplace Competencies				
Teamwork	Customer Focus	Planning & Organizing	Problem Solving & Decision Making	Working with Tools & Technology

Each competency is then described in terms of behavioral attributes.

Teamwork

Attributes
Builds interpersonal skills with individuals and other team members
Recognizes the importance of teamwork and its impact on business
Gives and receives feedback constructively
Leverages the strengths of others to accomplish a common goal

Customer Focus

Attributes
Provides prompt, efficient and personalized assistance to meet the requirements, requests, and concerns of customers
Demonstrates ability to assist customers in a professional manner
Provides thorough, accurate information to answer customers' questions and informs them of commitment times or performance guarantees

Planning & Organizing

Attributes
Plans and prioritizes work to manage time effectively and accomplish the assigned tasks
Develops plan, timeline, list of resources required, goals for projects and adheres to them
Finds ways to organize work to accomplish tasks more efficiently
Anticipates obstacles to project completion and develops contingency plans to address them

Problem Solving and Decision Making

Attributes
Identifies or recognizes the existence of a problem and analyzes the components of it

Foundational Competencies

Generates a variety of solutions to the problem

Effectively uses both internal and external resources to locate and gather information relevant to the problem

Working with Tools and Technology

Attributes
Identifies, selects, and applies appropriate tools or technological solutions to frequently encountered problems
Demonstrates appropriate use of basic tools to complete work functions
Operates tools and technology including(cleaning equipment; emergency fire or rescue equipment; hoist, winch or hydraulic boom; navigation technology or equipment; packaging or banding machine or equipment; track switches; global positioning systems (GPS) technology; hand or power tools; two way radio or mobile phone; vehicle repair tools or safety equipment; weighing or measuring devices in transportation
Uses appropriate personal protective equipment
Uses tools, equipment, and machinery safely and appropriately

Industry-Sector Technical Competencies

**Industry-Wide Technical Competencies**

The second block of the pyramid are **Industry Related Competencies** that are common to all jobs within a particular industry i.e. Transportation in this case. Tiers 4 & 5 reflected the consensus of industry professionals collected from these experts in a tightly-focused work session. The panel consisted of business leaders, managers, and education and training providers.

Tier 4 —Industry-Wide Technical Competencies

The first tier in Industry related competencies represents the knowledge, skills and abilities required by all occupations within a specific industry. Each industry has a unique set of technical competencies that have been defined by the respective subject matter experts (SME's). To derive these competencies, representatives from Missouri's Transportation industry met and brainstormed in a focus group setting.

FOCUS GROUP
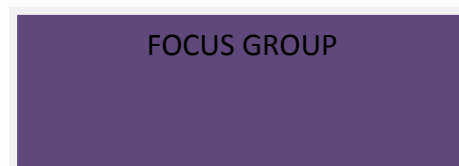
Logistics, Planning & Management	Transportation Operations & Maintenance	Regulations & Quality Assurance	Health, Safety & Environment

Logistics Planning and Management

Planning

Plans, organizes and executes logistics support activities such as maintenance planning, repair analysis and test equipment recommendations

Develops plans including routes and schedules for transporting people and goods

Determines locations of facilities and services within logistics networks

Determines transfer points for cargo

Develops documentation and information flow requirement and solutions

Determines documentation and other requirements

Plans and implement security measures to minimize loss and to create trust

Scheduling

Develops transportation routes and schedules

Schedules people, transportation equipment, and related resources

Adjusts planned routes and schedules in response to changing conditions and customer requirements

Monitoring

Maintains information on the movement of people/goods according to planned routes and schedules

Monitors the performance of transportation operations in meeting planned schedules and deliveries

Monitors and adjust transportation plans

Ensure that cargo arrives at the right location, on time and in the safest, most economical manner

Transportation Operations & Maintenance

Transportation Operations

Demonstrates understanding of activities related to dispatching, routing, and tracking transportation vehicles

Reviews route date prior to leaving for destination, schedules to obtain cargo loading information and traffic routing or control plans and schedules

Modes of Transportation

Rail – provides rail transportation of cargo using railroad rolling stock

Water – provides water transportation of cargo using watercraft such as ships, barges and boats

Truck – provides over-the-road transportation of cargo using motor vehicles, such as trucks and tractor trailers

Intermodal – provides transportation of freight using multiple modes of transportation, commonly taking place at a terminal specifically designed for such a purpose

Maintenance

Maintains the mobile equipment and monitors to maintain reliability and performance

Diagnoses reliability performance problems of equipment, subsystems, and/or components including electrical/electronic, fluid power, and mechanical systems and computer control systems

Prepares and maintains maintenance records and logs according to company policies and procedures and government regulations

Develops preventative maintenance plans and systems

Cleans equipment or machinery

Examines vehicles to detect malfunctions, damage or maintenance needed

Services vehicles with water, fuel or oil

Regulations & Quality Assurance

Compliance with Regulations and Standards

Complies with local, state and federal and international laws

Identifies and adheres to tariff and trade restrictions, transportation laws, labeling regulations, trade regulations, environmental regulations, OSHA regulations, requirements for global hazardous material packing; domestic and international regulations

Maintains transportation logs and other documents and records required by organizational policies and government laws and regulations

Maintains compliance with security and loss prevention systems

Maintains compliance with health, safety and environmental management requirements

Ensures compliance with organizational polices, contractors and service providers and government laws and regulations

Quality Assurance Continuous Improvement

Demonstrates knowledge of quality management systems and tools such as TM, Enterprise Lean and Six Sigma methodology and follows necessary procedures in work functions

Records, tracks and reports quality issues

Maintain and Inspecting

Ensures equipment is operating to prescribed standards

Inspects vehicle and equipment to determine repair or replacement needs

Inspects incoming/outgoing freight for tampering

Oversees work progress to verify safety or conformance standards

Monitors operations to ensure that staff members comply with administrative policies and procedures, safety rules, union contracts, and government regulations

Health, Safety, and Environment

Health and Safety Procedures

Prepares for health, safety , environmental emergencies

Follows organizational policies and procedures to maintain a safe work area

Wears personal protective equipment (PPE) as appropriate

Knows how to alert authorities in emergency situations

Follows traffic laws

Adheres to health and safety practices related to storing, cleaning, and maintaining tools, equipment and supplies

Completes safety training on pertinent equipment and applies safe operating procedures

Hazardous Materials(HAZMAT)

Participates in HAZMAT training as required or appropriate

Explains and correctly identifies hazardous materials, hazardous substances, and marine pollutants

Handles hazardous materials in accordance with governmental regulations and health standards

Knows where to find and how to use emergency response information

Understands the OSHA Hazard Communication Standard

Identifying Hazards and Maintaining Compliance

Indentifies and describes workplace hazards

Demonstrates understanding of major health, safety, and environmental risks

Reports health, safety and environmental problems

Conducts and/or participates in health, safety and environmental incident and hazard investigations and recommend corrective action

Maintains general safety in accordance with governmental regulations, health standards, company policy, procedure and practices

Performs regular audits and inspections to maintain health, safety and environmental compliance

Maintains documentation of compliance with health, safety and environmental management systems

Tier 5 —Industry-Specific Technical Competencies

This tier includes competencies that represent knowledge, skills and abilities required for all occupations within a specific industry sector. Missouri staffing patterns reflected high Transportation employment in specific sectors such as **Trucking**, **Railroad** and **Barge lines**. During the focus group sessions, industry representatives also vetted these as the three major sectors using Transportation in Missouri. Within each of these sectors, Knowledge Areas (KAs) were identified. These KA's provide a list of competencies that all workers in the specific industry must have to be effective in their occupations.

FOCUS GROUP

TIER 5 – Industry-Specific Technical Competencies		
Trucking	**Railroad**	**Barge Lines**
Safety Management	Safety Rules	Safety Rules
Spatial Acuity	Operating Rules	Fundamental principles of water hydrology, towboat, river flows, currents, eddies, forces and boyes
Breakdown Procedures	Signal Aspects and Indications	
Bridge low-weight Distribution	Air Brake and Train Handling Rules	
Communication Technology	Train make-up	Waterway Operations, traffic and navigation
Auxilary Power Units	Hazardous material Handling	
Hours of Service Rules	Federal Railroad Administration laws	Design / Balance Load
Trailer Tracking	EPA laws	Licensing
US Department of Transportation, Federal Motor Carrrier Safety Regulations and MoDoT Regulations		US Coast Guard and Army Corps of Engineers Rules on Barge Operation
EPA Idling Laws		EPA laws

Management Competencies

Occupation-Specific Requirements

Occupation-Specific Technical Competencies

Occupation-Specific Knowledge Areas

The last group consists of **Occupation related competencies** and is defined in terms of occupation related knowledge, education, credentials and performance. They are derived from the O*Net directory. A specific list of Transportation occupations has been focused on in these tiers. The 9 Targeted Transportation occupations were identified as follows: a custom industry staffing pattern was identified for the Transportation industry cluster in Missouri. These were sorted by their impact on the economy and then mapped against the US DOL's In Demand occupation list for Transportation. This list was then vetted by the State's industry specialists and is as described below:

O*NET-SOC Code	Title
53-3032	Truck Drivers, Heavy and Tractor-Trailer
53-7062	Laborers and Freight, Stock, and Material Movers, Hand
53-1031	First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators
43-5032	Dispatchers, Except Police, Fire and Ambulance
53-4011	Locomotive Engineers
43-5011	Cargo and Freight Agents
43-3021	Billing and Posting Clerks and Machine Operators
53-4031	Railroad Conductors and Yardmasters
53-4021	Railroad Brake, Signal and Switch Operators

It is important to note that the occupations in this list are obtained from the state's list of occupations in the Transportation cluster and do not include the entire gamut of Transportation occupations available.

Tier 6 —Occupation-Specific Knowledge Areas

This tier contains the specific **knowledge areas** that are required for the 9 targeted Transport occupations. Each knowledge area covers an area of expertise that the respective occupation requires.

O* NET DIRECTORY

TIER 6 –Occupation Specific Knowledge Areas for :

Truck Drivers, Heavy and Tractor-Trailer

Laborers and Freight, Stock, and Material Movers, Hand

First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators

Dispatchers, Except Police, Fire and Ambulance

Locomotive Engineers

Cargo and Freight Agents

Billing and Posting Clerks and Machine Operators

Railroad Conductors and Yardmasters

Railroad Brake, Signal and Switch Operators

Truck Drivers, Heavy and Tractor-Trailer

- Transportation
- Public Safety and Security
- English Language
- Law and Government
- Mathematics

Laborers and Freight, Stock and Material Movers, Hand
- English Language
- Public Safety and Security

First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators
- Transportation
- Customer and Personal Service
- Administration and Management
- Production and Processing
- Public Safety and Security
- Personnel and Human Resources
- Computers and Electronics
- Education and Training
- Mathematics
- Economics and Accounting

Dispatchers, Except Police, Fire and Ambulance
- Transportation
- Clerical
- English Language
- Public Safety and Security

Locomotive Engineers
- Transportation
- Public safety and Security
- English Language

Cargo and Freight Agents
- Transportation
- Customer and Personal Service
- English Language

Billing, Posting, and Calculating Machine Operators
- Clerical
- Economics and Accounting
- English Language

Railroad Conductors and Yardmasters
- Transportation
- Public Safety and Security
- Customer and Personal Service

Railroad Brake, Signal, and Switch Operators
- Transportation
- Customer and Personal Service
- Public Safety and Security

Tier 7 —Occupation-Specific Technical Competencies

All occupations require certain technical competencies to perform the job. This tier contains **technical competencies** that are specific to the 9 targeted Transportation occupations. Listed below are the

ones required for each technical competency.

O* NET DIRECTORY

TIER 7 –Occupation Specific Technical Competencies for:
Truck Drivers, Heavy and Tractor-Trailer
Laborers and Freight, Stock, and Material Movers, Hand
First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators
Dispatchers, Except Police, Fire and Ambulance
Locomotive Engineers
Cargo and Freight Agents
Billing and Posting Clerks and Machine Operators
Railroad Conductors and Yardmasters
Railroad Brake, Signal and Switch Operators

Truck Drivers, Heavy and Tractor-Trailer

Tools used in this occupation	Technology used in this occupation
Flatbed Trailers – Lowboy trailers, Tilt Trailers Hoist – Cargo hoists Location based messaging service platforms – Satellite linkup systems Snowplow attachments – Plow attachments Telescoping boom lift – Boom trucks Trailer hitches – Sliding fifth wheels; Sliding tandem axles Wheel loaders	Database user interface and query software – Easy Trcuker software; Fog Line Software Truckn2004; Truckers Helper software Inventory management software – Computerized inventory tracking software Route navigation software –ALK Technologies PC*Miler; MarcoSoft Quo Vadis

Laborers and Freight, Stock and Material Movers, Hand

Tools used in this occupation	Technology used in this occupation
Dollies Forklifts – Lift trucks Hand trucks or accessories – Hand trucks Jacks – Pallet jacks Pallet trucks – Pallet transport trucks Wrapping machinery – Banding machines	Database user interface and query software- Data entry software Industrial control software – Machine control software Inventory management software – Inventory tracking software Spreadsheet software

First line Supervisors/Managers of Transportation and Material-Moving Machine and Vehicle

Operators

Tools used in this occupation	Technology used in this occupation
Forklifts Hand trucks or accessories – Hand trucks Pallet trucks- Pallet jacks Screwdrivers – Phillips head screwdrivers; Straight screwdrivers Welding tools – Welding equipment	Bar coding software – Bardcode software Enterprise resource planning ERP software- SAP software Materials requirements planning logistics and supply chain software - @Road GeoManager; eLading Bill of Lading Software; UPS Logistics Technologies Roadnet Transportation Suite; XATA XATANET Mobile location based service software – Accellos Real Dispatch; Commercial vehicle operation CVO software Office suite software – Microsoft Office

Occupation Related Competencies

Dispatchers, Except Police, Fire and Ambulance

Tools used in this occupation	Technology used in this occupation
Rail switching systems – Switch controls; Tower switching machines

Railway signaling systems – Centralized traffic control signals; Signal controls

Special purpose telephones – Multi-line telephone systems ; Personal banking chamber PBC telephones

Two way radios – Mobile radios

Vehicular global positioning systems- Job dispatch and vehicle tracking systems | Aviation ground support software- Bornemann Associates Flight Plane; Sabre software

Customer relationship management CRM software- Command Alkon COMMANDconcrete; Digital Gateway e-automate

Database user interface and query software- Database software; Sky Scheduler software

Expert system software – Computer aided dispatching auto routing software; Rail Traffic Track Warrant Control System

Mobile location based service software – Air-Trak Cloudberry; Global position system GPS software; Situation resource tracking software; Transportation management software |

Locomotive Engineers

Tools used in this occupation	Technology used in this occupation
Electronic equipment use in the cab	Software used to run trains

Cargo and Freight Agents

Tools used in this occupation	Technology used in this occupation
N/A	Electronic interface used to do their jobs

Billing and Posting Clerks and Machine Operators

Tools used in this occupation	Technology used in this occupation
N/A	N/A

Railroad Conductors and Yardmasters

Tools used in this occupation	Technology used in this occupation
Dock plates – Bridge Plates

Rail switching systems – Switching systems controls

Specialty wrenches – Switch adjusting wrenches; Terminal wrenches

Wire or cable cutters – Cable sheath cutters | Expert system software – Positive train control PTC systems

Industrial control software – Automated equipment identification AEI software; RailComm DocYard; SAIV Integrates AEI Software; Softrail AEI Automatic Yard Tracking System

Inventory management software- Inventory tracking software; Softrail AEI Rail & Road Manager

Materials requirement planning logistics and supply chain software – Bourque Data Systems YardMaster; Freight reservation software

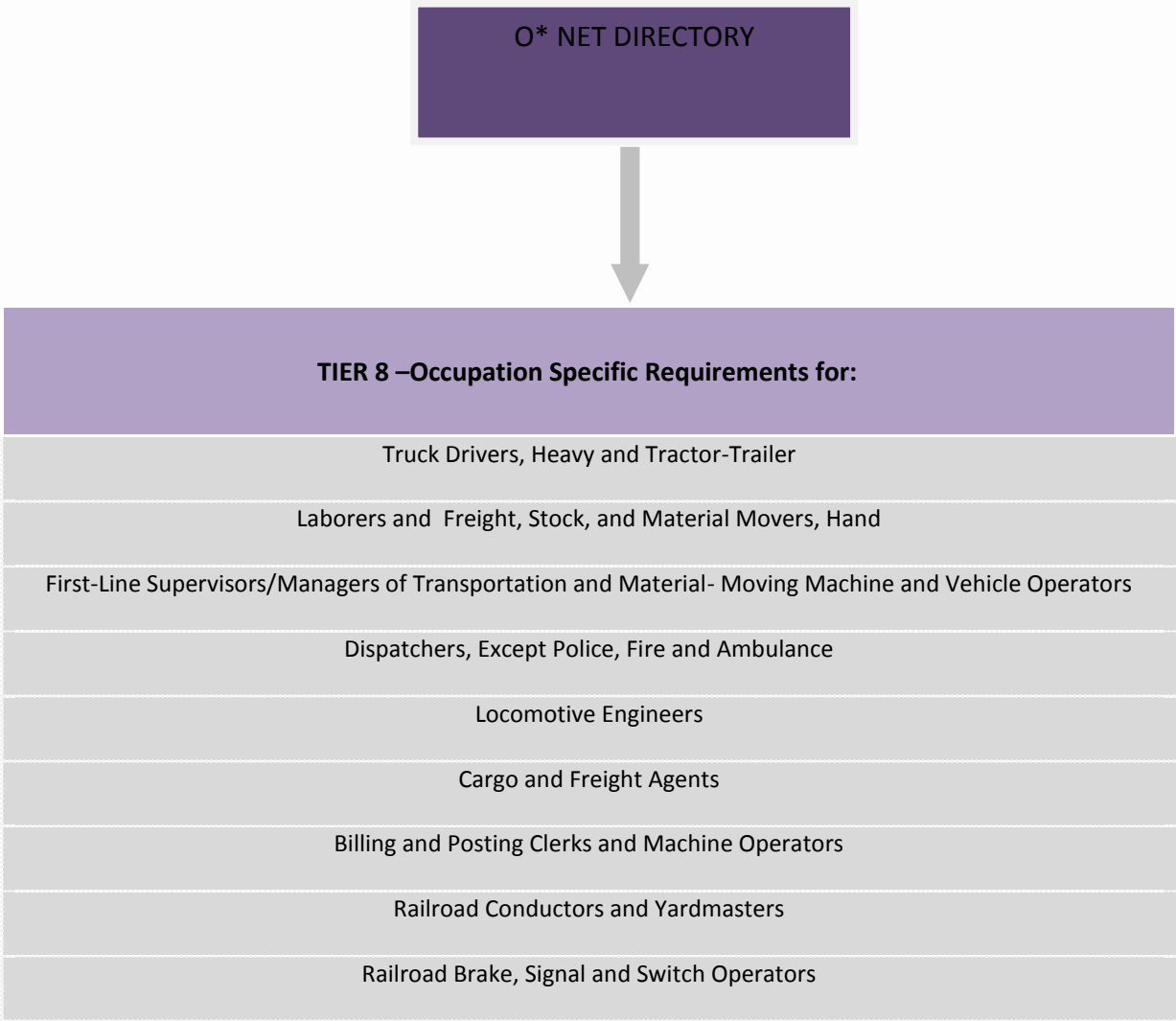Office suite software – Microsoft Office |

Railroad Brake, Signal and Switch Operators

Tools used in this occupation	Technology used in this occupation
N/A	Signals and switching equipment

Tier 8 – Occupation Specific Requirements

This tier includes **occupation specific job credentials** such as educational degrees, certifications, licensures, physical training requirements specific to a particular occupation within an industry. The US Department of Education provides a taxonomic scheme of programs of study and descriptions called Classification of Instructional Programs (CIP). The National Crosswalk Service Center linked this data with the list of occupations in the O*NET Directory and created a comprehensive list of instructional programs for each occupation in each industry.

O* NET DIRECTORY

TIER 8 –Occupation Specific Requirements for:
Truck Drivers, Heavy and Tractor-Trailer
Laborers and Freight, Stock, and Material Movers, Hand
First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators
Dispatchers, Except Police, Fire and Ambulance
Locomotive Engineers
Cargo and Freight Agents
Billing and Posting Clerks and Machine Operators
Railroad Conductors and Yardmasters
Railroad Brake, Signal and Switch Operators

Truck Drivers, Heavy and Tractor-Trailer

CIP Code	CIP Title
490205	Trucks and Bus Driver/Commercial Vehicle Operation

Laborers and Freight, Stock, and Material Movers, Hand

CIP Code	CIP Title
-	Most of the skills for this job are learnt through on-the-job training

First-Line Supervisors/Managers of Transportation and Material- Moving Machine and Vehicle Operators

CIP Code	CIP Title
-	Most of the skills for this job are learnt through on-the-job training

Dispatchers, Except Police, Fire and Ambulance

CIP Code	CIP Title
-	National Academy of Railroad Sciences program for dispatchers

Locomotive Engineers

CIP Code	CIP Title
499999	Transportation and Materials Moving and trainings provided by National Academy of Railroad Sciences

Cargo and Freight Agents

CIP Code	CIP Title
520408	General Office Occupations and Clerical Services and trainings provided by National Academy of Railroad Sciences

Billing and Posting Clerks and Machine Operators

CIP Code	CIP Title
520302	Accounting Technology/Technician and Bookkeeping

Railroad Conductors and Yardmasters

CIP Code	CIP Title
490205	Trucks and Bus Driver/Commercial Vehicle Operation and trainings provided by National Academy of Railroad Sciences

Railroad Brake, Signal and Switch Operators

CIP Code	CIP Title
490205	Trucks and Bus Driver/Commercial Vehicle Operation and trainings provided by National Academy of Railroad Sciences

Tier 9 – Management Competencies

This tier includes competencies that are specific to supervisory and managerial occupations within this industry. These competencies are:

- Manpower Planning

- Delegating

- Managing Work Flow

- Entrepreneurship

- Leadership

- Developing & Monitoring

- Preparing and Managing Budgets

- Team Building

- Developing an Organizational Vision

- Managing Resources

Competency models can serve as a map for education/training providers, employers, job seekers, workforce and economic developers. A sustainable pipeline of skilled workers can be built when all these stakeholders work together in cooperation. Some recommendations for the use of the Transportation competency Model are:

1. As emphasized continuously by employers, one of the key findings of this study was the shortage of the presence of "soft skills", especially in the incumbent workforce. It was not sufficient to be technically qualified alone; employers expressed the need for them to possess additional skills as described in the Foundational Competencies tiers of this model. This message needs to be conveyed to all education providers in the state. The Department of Economic Development (DED) can collaborate with partners in Missouri Department of Higher Education (MDHE) to promote educational efforts geared towards preparing students for college and the workplace. This work could be accomplished through :
   ❖ Creating a cross-walk between the Curriculum Alignment Initiative entry-level competencies and the foundational competencies in Tiers 1& 2
   ❖ Having MDHE promote the findings of the Transportation competency model report to postsecondary institutions, for their use in reviewing current curriculum for Transportation-related degree programs and aligning business driven competencies with entry and exit skills as defined by education/training providers
   ❖ Present progress on these activities to the P-20 Council by the end of state fiscal year 2010
2. As the Transportation field contains both occupations that require postsecondary training as well as those that do not, hence soft skills training/development needs to start as early as K-12. The Department of Elementary Secondary Education (DESE) along with the Missouri Center for Career Education can use several of the report's findings as a useful tool in their role as a change agent for the field of career education in Missouri in the following ways:
   ❖ Utilize Tiers 1-5 as the basis for developing measurable learner objectives (MLOs) for use by classroom teachers in an occupational area
   ❖ For programs that are occupationally specific and represented in the targeted sectors, Tier 5 could also be used as a basis for curriculum development
   ❖ The model could also be used as a resource for new teacher induction programs and other professional development efforts
   ❖ The results could be integrated into work on programs of study, curriculum development and data driven decision making
3. This report can also assist the Transportation council (comprising of Transportation industry top executives and education training providers) direct creative strategic plans intended for growth within the Transportation sector.
4. The competencies derived from the Transportation competency model serve as a training map for specific TRANSPORTATION occupations and could be compared to current training available in public postsecondary institutions to identify "skill gaps" as identified by employers with results tied to regional demand.

❖ A further gap analysis between Missouri employer training needs versus Missouri education/training program offerings could be conducted

5. Integrate the Transportation competency model results in the development of career information products for job seekers and both elementary/secondary and postsecondary students. This could be disseminated through :

❖ The Public Outreach Partnership (POP), a collaborative workgroup with representatives from DESE, DHE, MERIC, Department of Economic Development Division of Workforce Development (DWD), MCCE and the Missouri Chamber of Commerce. The POP workgroup represents state agencies concerned with education and workforce development that are helping inform and build awareness among the public, particularly students and potential students, of targeted careers, educational and industry trends, and workforce development priorities.

❖ Missouri Connections, a website that helps students (grades 7-16), their parents, guidance counselors, and educators in career exploration and education planning.

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